ENGLISH TRANSLATION OF IPER ANNEXES

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...agglomeration temperature, the synthetic material provided in the processing cylinder will be melted, which in turn leads to an overload of the drive motor.

Another technological approach consists in that primarily film waste in its unshredded form is directly fed into an extruder screw having a diameter that is widened in its feed area, which extruder screw subsequently converges conically in the screw root or in the diameter, viewed in the direction of the material flow. Said embodiment involves the disadvantage that, in the feed area, the extruder screw exerts only a small amount of wall friction on the loose synthetic material due to the low bulk density of the material and hence a corotation of the material in the feed area is likely, preventing the material from advancing, which results in a "pumping" action of the extruder. In particular if said device is charged with unshredded edge trim waste whose delivery speed is higher than the peripheral speed of the screw, the result will be an irregular charging of the extruder.

From WO 9816360 and DE 197 14 944 A1 and US 6,126,100, respectively, a device is known wherein loose synthetic material is supplied to a processing cylinder which exhibits a knife-supporting part to which radially projecting knives are attached along a helical line and a discharge-element-supporting part whose discharge elements are formed from a feed screw. Optionally, a cutting sleeve is slipped onto the processing cylinder, namely onto the end region of the processing cylinder, adjacent to the feed screw. The loose synthetic material is cut on the knife-supporting part of the processing cylinder and compressed by the discharge-element-supporting part of the processing cylinder, before a tangentially flanged extruder is filled. However, said device has the disadvantage that the material is always conveyed in the direction of the discharge-end bearing, the deflection thus leading to an increase in thermal degradation and hence to an increase in the bearing load. In an embodiment illustrated in said document, the extruder is charged via two counter-rotating feed screws provided on one shaft, with the extruder being located in the centre between the screws. Said device involves the drawback that the synthetic material has to be pre-shredded.

A shredding device disclosed in EP A-0 140 869 is provided with counter-rotating, intermeshing shredding disks for the size reduction of the plastic waste supplied to the known shredding device, which disks are arranged on two shredding rolls lying in parallel to each other. The size reduction of the plastic waste takes place between the shredding disks and deflector elements which, in the disk clearance of the respective other shredding roll, extend from below into the space between the drive shafts. The material broken up by the shredding rolls is discharged through a discharge shaft 3 which preferably directly forms the fill opening of a screw press disposed underneath.

Furthermore, devices are known which have a shredder shaft that operates in parallel to the extruder screw and feeds material into the screw. Since the shredder shaft is arranged in parallel to the extruder and hence the extruder shaft must be expanded by the width of the shredding device, the space required by said device is very large.

Amended claims:

1. A device for the processing of plastic waste, comprising a shredding device (9) arranged in a casing (1) and rotatable around an axis of rotation (2), which shredding device carries a plurality of knives (3) at its periphery, and an extruder comprising an extruder screw (4), with the casing (1) exhibiting a feed opening (5) for the radial supply of plastic waste to the shredding device (9), characterized in that, in the casing (1) in the area of the shredding device (9), a discharge opening (6) for the delivery of shredded plastic waste to the extruder is formed, by means of which opening the shredding device (9) communicates with the extruder screw (4) in that the shredding device (9) and its knives (3), respectively, can be moved past the extruder screw (4) at such a small distance (h) that effective shear gaps are formed between the knives (3) of the shredding device (9) and a helix (4a) of the extruder screw (4).

2. A device for the processing of plastic waste according to claim 1, characterized in that the distance (h) between the knives (3) of the shredding device and the extruder-screw helix (4a) amounts to less than 10 cm, preferably less than 5 cm, and most preferably less than 3 cm.

3. A device for the processing of plastic waste according to claim 1 or 2, characterized in that the axis of rotation (2) of the rotatable shredding device (9) is disposed relative to the rotational axis of the extruder screw (4) at an angle (β) of 60 – 120°, preferably at about a right angle.

4. A device for the processing of plastic waste according to any of the preceding claims, characterized in that the shredding device (9) has a horizontal axis of rotation (2) and is arranged above the extruder.

5. A device for the processing of plastic waste according to any of the preceding claims, characterized in that the knives (3) disposed around the periphery of the shredding device are arranged in a helical manner so that they support the conveyance of synthetic material toward the discharge opening (6).

6. A device for the processing of plastic waste according to any of the preceding claims, characterized in that devices for supporting the conveyance of material toward the discharge opening (6), in particular helical grooves or webs (7) and/or air nozzles (8), are provided at the inner wall of the casing (1), which wall surrounds the shredding device.

7. A device for the processing of plastic waste according to any of claims 5 or 6, characterized in that the discharge opening (6) is arranged roughly at the mid-point of the length of the shredding device (9).

8. A device for the processing of plastic waste according to any of the preceding claims, characterized in that the rotational speed of the extruder screw (4) can be adjusted depending on the load of the shredding device (9), wherein the load can preferably be determined via pressure elements or the electric current consumption of a drive motor of the shredding device.

9. A device for the processing of plastic waste according to any of the preceding claims, characterized in that a pocket-like expansion is provided as a buffer storage for shredded plastic waste in the feed area of the extruder screw.

10. A device for the processing of plastic waste according to any of the preceding claims, characterized in that the shredding device (9) cooperates with a driven slide (10) in order to press the synthetic material against the knives (3), depending on the load on the axis of rotation (2) of the shredding device.

11. A device for the processing of plastic waste according to any of the preceding claims, characterized in that the extruder screw is widened to a larger diameter in the feed area and/or tapers conically toward the material-discharge end.

12. A device for the processing of plastic waste according to claim 1, characterized in that the axis of rotation (2) of the shredding device (9) runs in parallel to the axis of the extruder screw (4).